



Cesarean Section At Full Cervical Dilatation: When Is It Troubling For Newborn?

Tam Servikal Açıklıkta Sezaryen: Yenidoğan İçin Ne Zaman Tehlikeli?

Cesarean Section At Full Cervical Dilatation

Mahmut Kuntay Kokanalı, Hasan Onur Topçu, Demet Kokanalı, Ali Irfan Güzel, Burak Elmas, Mehmet Keçecioglu, Sabri Cavkaytar, Melike Doğanay
Zekai Tahir Burak Woman's Health Education and Research Hospital, Ankara, Turkey

Özet

Amaç: Tam servikal dilatasyon durumunda yapılan sezaryen operasyonu sonrasındaki kötü perinatal sonuçlarla ilişkili potansiyel risk faktörlerini araştırmayı amaçladık. **Gereç ve Yöntem:** Tam servikal açıklıkta sezaryen olan 49 kadın bu retrospektif vaka-kontrol çalışmasına dahil edildi. Yenidoğan yoğun bakım ünitesine başvurunun kötü perinatal sonuç olarak tanımlandığı duruma sahip kadınlar vakalar olurken diğer kadınlar kontroller idi. Kötü perinatal sonuçla ilişkili olabilecek faktörler çoklu regresyon analizi ile incelendi. Kötü perinatal sonuçla ilişkili anlamlı faktör olarak bulunan durumlar varlığında tam servikal açıklıkta bekleme süresine ait eşik değerini belirlemek için ROC analizi uygulandı. **Bulgular:** 49 kadının 9 (18.4%) tanesi vaka grubunu oluştururken 40 (81.6%) tanesi kontrol grubunda idi. Çoklu regresyon analizinde persiste oksiput posterior pozisyonu kötü perinatal sonuç için anlamlı tek faktör olarak bulundu. Persiste oksiput posterior varlığında tam servikal açıklıkta 1.25 saat beklemenin ROC analizi sonucunda kötü perinatal sonucu öngörmeye 75% duyarlılık ve 50% özgüllüğe sahip olduğu bulundu. **Tartışma:** Persiste oksiput posterior pozisyon varlığı, tam servikal açıklıkta yapılan sezaryen durumunda kötü perinatal sonuç için risk faktörü olabilir. Tüm obstetrisyenler persiste oksiput posterior varlığında tam servikal açıklıkta beklenenecek süre konusunda dikkatli olmalı ve 1 saatten fazla beklememeli.

Anahtar Kelimeler

Sezaryen; Servikal Açıklık; Perinatal Sonuç

Abstract

Aim: We aimed to investigate the potential risk factors related to poor perinatal outcomes after cesarean section performing at full cervical dilatation. **Material and Method:** Forty-nine women who underwent cesarean section at full cervical dilatation were enrolled in this retrospective case-control study. Women with poor perinatal outcome defined as the presence of admission to neonatal intensive care unit were the cases while the women without poor perinatal outcome were controls. Two groups were analyzed to determine possible risk factors for poor perinatal outcome with multivariate logistic regression model. ROC curve analysis was used to find cut off point of duration of arrest at full cervical dilatation for poor perinatal outcomes with significant factors. **Results:** Of 49 women, 9 (18.4%) women constructed the case group while 40 (81.6%) women were in control group. In multivariate analysis persistent occiput posterior position was the only factor to be significant for the poor perinatal outcome after cesarean section at full cervical dilatation. The best cut-off point of duration of arrest at full cervical dilatation for poor perinatal outcome with persistent occiput posterior position established by the ROC curve was 1.25 hour, showing a sensitivity of 75.0 %, specificity of 50.0 %. **Discussion:** Persistent occiput posterior position may be a risk factor for adverse perinatal outcomes of cesarean section at full cervical dilatation. All obstetricians should be aware of duration of arrest at full cervical dilatation with persistent occiput posterior position and this interval should not be longer than 1 hour.

Keywords

Cesarean Section; Cervical Dilatation; Perinatal Outcome

DOI: 10.4328/JCAM.3269

Received: 27.01.2015 Accepted: 14.02.2015 Printed: 01.11.2016 J Clin Anal Med 2016;7(6): 777-80

Corresponding Author: Mahmut Kuntay Kokanalı, Güzeltepe Mah. Halide Nusret Zorlutuna Sok. No: 6/4, Cankaya, Ankara, Türkiye.

GSM: +905052429576 F.: +90 3123124931 E-Mail: kuntaykokanal@gmail.com.tr

Introduction

Cesarean Section (CS) is a common surgical procedure with an increasing rate among obstetrics practice [1]. The consideration of this operation as the safest option for childbirth and the lack of training in performing an instrumental vaginal delivery are the most available reasons of this increase [2]. Fear of litigation is also an important factor leading to a higher primary CS rate [3]. Furthermore, it nowadays appears that CS is an alternative to instrumental vaginal delivery. For the last three decades, most obstetricians therefore prefer CS instead of operative vaginal delivery such as vacuum and forceps extraction especially used for the arrest of descent during full cervical dilatation [4,5].

CS at full cervical dilatation is a technically difficult procedure, because fetal head is often deeply engaged to maternal pelvis. This condition generally contributes to higher maternal morbidity, usually resulting from tearing of the lower uterine segment, extension of the uterine incision and incision of the urinary bladder. Additionally, it is associated with an increased risk of neonatal morbidity. If a delay in the decision to perform an emergency section occurs, fetus may come under a greater risk of developing hypoxia that leads to brain damage and possible disability in its future life [6,7]. Thus, promptly identification of the potential risk factors for poor perinatal outcomes before performing CS at full cervical dilatation is important.

In our study, we aimed to investigate the potential risk factors which are related to the poor perinatal outcomes following CS at full cervical dilatation, with a view to suggesting strategies for better perinatal care protocols in the future.

Material and Method

This retrospective study was carried out on 49 term pregnant women who underwent CS at full cervical dilatation during two years period at Zekai Tahir Burak Woman’s Health Education and Research Hospital. The study was conducted after the approval was obtained from the institutional review board of the hospital. Because of the retrospective design of the study, informed consent was considered unnecessary.

Presence of the neonatal intensive care unit (NICU) admission was defined as poor perinatal outcome. Women with poor perinatal outcomes were defined as cases while women without poor perinatal outcomes were controls. Data collected from chart review included maternal age, body mass index (BMI), number of parity, gestational age (corrected by the first trimester ultrasonography), presence of meconium stained amniotic fluid (MSAF), persistent occiput posterior (POP) position, duration of arrest at full cervical dilatation, birth weight and indications of CS. The duration between the decision to carry out CS and delivery was noted when fetal distress was detected. No medical complication (gestational diabetes mellitus, hypertensive disorders..etc) was noted. Intravenous oxytocin induction was used for all women.

Data were analyzed via SPSS version 15.0 (Statistical Package for Social Sciences, for Windows). Continuous variables were compared via the independent simple t test. Categorical variables were compared via x2 test. Odds ratios and 95% confidence intervals (CIs) for poor perinatal outcomes after CS at full cervical dilatation were calculated via a logistic regression

model. Receiver Operating Characteristic (ROC) curve analysis was used to find cut off point (the point with the highest sensitivity and specificity) of duration of arrest at full cervical dilatation for poor perinatal outcomes with significant factors. A p value of less than 0.05 was taken to be significant.

Results

Forty-nine women who underwent CS at full cervical dilatation were retrospectively evaluated. Poor perinatal outcomes (due to perinatal respiratory distress problems) were observed in 9 (18.4%) women who were in case group. 40 (81.6%) women had no poor perinatal outcomes and they were in control group. The clinical characteristics of groups were listed in Table 1. With

Table 1. Characteristics of the groups

	Cases (n=9)	Controls (n=40)	p
Maternal age (years)	26.7±3.0	26.2±2.7	0.63
Primiparity	8 (88.9)	33 (82.5)	0.64
Gestational age (days)	281.8±3.7	282.0±4.7	0.92
BMI (kg/m2)	32.5±1.8	31.5±1.5	0.09
Duration at full cervical dilatation (hours)	1.6±0.7	1.4±0.5	0.31
POP position	7 (77.8)	7 (17.5)	0.001
MSAF	5 (55.5)	11 (27.5)	0.11
Fetal distress	5 (55.6)	16 (40.0)	0.39
CPD+ failure in labor progress	4 (44.4)	24 (60.0)	0.39
MSAF+Fetal distress	4 (44.4)	6 (15.0)	0.04
Decision to delivery interval during foetal distress (minutes)	18.4±3.7	17.6±4.3	0.66
Birth weight (grams)	3876.7±124.4	3899.8±149.7	0.67

Values were given as mean±standard deviation, number (percentage). BMI: Body Mass Index; POP:Persistent Occiput Posterior; MSAF:Meconium Stained Amniotic Fluid; CPD: Cephalopelvic Disproportion p<0.05 was considered statistically significant

respect to mean of maternal age, gestational age, BMI, duration of arrest at full cervical dilatation, birth weight of newborn, duration between decision to carry out CS and delivery during fetal distress, ratio of primiparity, MSAF, fetal distress (defined when non reassuring FHR patterns including repeated late decelerations and/or severe variable decelerations, prolonged deceleration, tachycardia, or reduced variability were detected by external fetal heart monitoring during labor) and cephalopelvic disproportion (CPD)+failure in labor progress, there were no significant differences between the groups (p>0.05 for all parameters). Presence of POP position was statistically more common among cases (7/9; 77.8%) as compared to control group (7/40; 17.5%) (p=0.001). The ratio of CS operation due to MSAF+Fetal distress was significantly greater in cases (4/9; 44.4%) than in control group (6/40; 15.0%) (p=0.04). However, in multivariate analysis where all the factors were evaluated, POP position was the only significant factor to be significant for the poor perinatal outcome after CS at full cervical dilatation [p=0.03; Odds Ratio (OR)=16.5; 95% confidence interval (CI)=2.8-96.9] (Table 2).

The best cut-off point of duration of arrest at full cervical dilatation for poor perinatal outcome with POP position established by the ROC curve was 1.25 hour, showing a sensitivity of 75.0 %, specificity of 50.0 % (Figure 1) (Table 3).

Table 2. Multivariate logistic regression analysis model of factors for poor perinatal outcome

	Wald	OR	95% CI	P
Maternal age	0.3	0.8	0.5-1.5	0.56
Primiparity	0.4	1.7	0.2-15.8	0.51
Gestational age	0.6	1.1	0.8-1.6	0.45
BMI (kg/m ²)	4.3	0.2	0.0-1.1	0.08
Duration at full cervical dilatation	0.3	0.4	0.0-14.0	0.60
POP position	4.8	16.5	2.8-96.9	0.03
MSAF	1.0	3.3	0.7-14.6	0.32
Foetal distress	1.3	1.9	0.4-8.1	0.25
MSAF+Foetal distress	0.1	4.5	0.9-21.9	0.06
CPD+Failure in labor progress	0.9	0.5	0.1-2.3	0.96
Decision to delivery interval	0.8	1.2	1.0-1.9	0.84
Birth weight	0.7	1.0	1.0-1.1	0.39

BMI: Body Mass Index; POP:Persistent Occiput Posterior; MSAF:Meconium Stained Amniotic Fluid; CPD: Cephalopelvic Disproportion; OR:Odds Ratio; CI:Confidence Interval p<0.05 was considered statistically significant

Figure 1. ROC Curve for duration of arrest at full cervical dilatation and poor perinatal outcome with persistent occiput posterior position

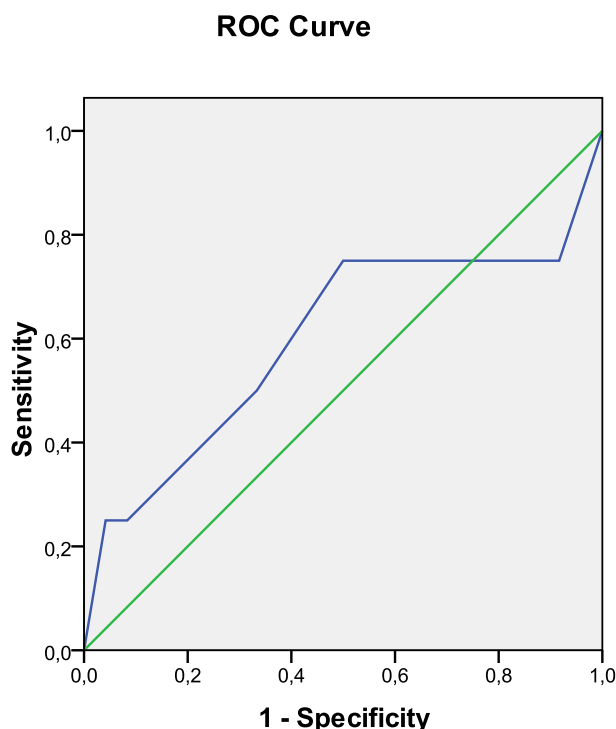


Table 3. Area under ROC Curve for duration of arrest at full cervical dilatation with persistent occiput posterior position

	AUC	SE	95% CI	p	Value (hours)	Sensitivity(%)	Specificity(%)
Duration of arrest at full cervical dilatation	0.60	0.2	0.2-0.9	0.048	1.25	75.0 %	50.0 %

AUC: Area Under Curve; SE: Standard Error; CI:Confidence Interval; POP:Persistent Occiput Posterior Position p<0.05 was considered statistically significant

Discussion

Although there have been several studies indicating increased maternal and perinatal morbidity after CS at full cervical dilatation, less is known regarding the factors that are related to poor perinatal outcome following CS at full cervical dilatation. Previous studies especially focused on the duration of the second stage of labor in relation to maternal and perinatal outcomes.

In a large population-based cohort study, it has been reported that risks of both maternal and perinatal adverse outcomes rise with increased duration of the second stage of labor, particularly for duration longer than 3 hours in nulliparous women and longer than 2 hours in multiparous women [8]. In our study, the length of the second stage of labor was not identified as confounding factors for the poor perinatal outcome. Because, the groups were similar in terms of the length of second stage of labor and there were no nulliparous woman with a duration of longer than 3 hours or multiparous woman with longer than 2 hours duration of second stage of labor.

In our study, we have identified the presence of persistent occiput posterior position as significant risk factors for poor perinatal outcome following CS at full cervical dilatation. POP position is the most common malposition in labor, with an estimated prevalence ranging from 2 to 13% [9,10]. Unfortunately, this condition is associated with higher risk of adverse perinatal outcomes including 5-minute Apgar score less than 7, acidic umbilical cord gases, MSAF, birth trauma, admission to the intensive care nursery, and longer neonatal stay in the hospital [10-12]. During POP position, fetal head do not enter the birth channel with appropriate head diameters which slows the progression of baby through the pelvis. Also, the bony parts of baby become closer side by side with maternal bone portions. In this position, the pressure applied from bony pelvis to fetal head has different direction and intensity. Namely, the exerted pressure on fetal trachea and orbitas has increased and this increase yields to vagal stimulation that may cause fetal bradycardia [13]. And also prolonged labor may result in increment of fetal hypoxia [14]. Thus it is possible that POP position is a risk factor for poor perinatal outcomes at CS with full cervical dilatation. Additionally, we found that 1.25-hour-duration of arrest at full cervical dilatation with POP position showed the best sensitivity (75%) and specificity (50%) in predicting poor perinatal outcomes. To the best of our knowledge this is the first reported data about this topic in literature. However, we think that more studies are needed to justify and improve our results in order to use this parameter in obstetrical practice.

MSAF is occurred as a result of release of fetal colon material into the amniotic fluid. MSAF is seen in 12-16% of deliveries and this prevalence increases with gestational age [15]. It may indicate the physiologic process involving the mature fetal colon or acute/chronic hypoxic event, thereby making it a warning sign of a fetal compromise [16]. It may also lead to serious problems such as chorioamnionitis, intrauterine infection, meconium aspiration syndrome, cerebral palsy, bronchopulmoner dysplasia and perinatal mortality [17,18]. In order to decrease the peril of MSAF and prevent fetus from hypoxia, such labors end up in CSs. Because of these, MSAF is a really worrisome condition for both obstetricians and pediatricians, that increases the caesarean rates and NICU admissions [19,20]. In our study, neither presence of MSAF nor presence of fetal distress revealed significant differences between the groups. On the other hand, we found that MSAF with fetal distress was statistically more common in cases compared with controls, although it was not found as an significant factor for poor perinatal outcome in multivariate regression model. These results suggest that meconium alone cannot be relied on as an

indication of fetal hypoxia, but with the presence of fetal heart rate pattern, it can be a sign of fetal hypoxia as noted previously [20]. Theoretically, at the time of delivery, the compression of fetal head or cord may result in fetal hypoxia and bradycardia leading intestinal ischemia. This lack of oxygen process increases the gastrointestinal peristalsis and relaxes the anal sphincter which causes the meconium passage into amniotic fluid [21]. It has been accepted universally that CS should be performed without delay, if the situation is extremely life threatening for mother or fetus or both [22-25]. Thus, in the condition of fetal distress, the interval in minutes from the date and time of decision to carry out CS to the date and time of delivery of the baby that is defined as decision-to-delivery interval (DDI) [23,24] has great importance and a DDI of 30 minutes for emergency CS has been widely recommended in order to avoid the adverse neonatal effects of perinatal asphyxia [25]. Our hospital is a tertiary hospital and all the CS operations can be performed with a DDI of less than 30 minutes during abnormal fetal heart rate pattern. Therefore, presence of fetal distress may not be a significant risk factor for poor perinatal outcome in our study. Although retrospective design and relatively small participants were the limitations of our study, we report that POP position at full cervical dilatation may be a risk factor for adverse perinatal outcomes. All obstetricians should be aware of duration of arrest at full cervical dilatation with POP position and this interval should not be longer than 1 hour. However, we believe that further prospective studies with more participants are needed to suggest acceptable protocols about this topic.

Competing interests

The authors declare that they have no competing interests.

References

- Martin JA, Hamilton BE, Ventura SJ, Osterman MJ, Kirmeyer S, Mathews TJ et al. Births: final data for 2009. *Natl Vital Stat Rep* 2011;60:1-70.
- Gharaibeh AM, Al-Bdour AE, Akasheh HF. The mounting rate of cesarean sections: is it accompanied by a drop in instrumental births? *Saudi Med J* 2008;29:267-70.
- Vimercati A, Greco P, Kardashi A, Rossi C, Loizzi V, Scioscia M et al. Choice of cesarean and perception of legal pressure. *J Perinat Med* 2000;28:111-7.
- Gei AF. Prevention of the first cesarean delivery: the role of operative vaginal delivery. *Semin Perinatol* 2012;36:365-73.
- Unterscheider J, McMenamin M, Cullinane F. Rising rates of cesarean deliveries at full cervical dilatation: a concerning trend. *Eur J Obstet Gynecol Reprod Biol* 2011;157:141-4.
- Pergialiotis V, Vlachos DG, Rodolakis A, Haidopoulos D, Thomakos N, Vlachos GD. First versus second stage C/S maternal and neonatal morbidity: a systematic review and meta-analysis. *Eur J Obstet Gynecol Reprod Biol* 2014 ;175:15-24.
- Leung TY, Lao TT. Timing of cesarean section according to urgency. *Best Pract Res Clin Obstet Gynaecol* 2013;27:251-67.
- Allen VM, Baskett TF, O'Connell CM, McKeen D, Allen AC. Maternal and perinatal outcomes with increasing duration of the second stage of labor. *Obstet Gynecol* 2009;113:1248-58.
- Cheng YW, Hubbard A, Caughey AB, Tager IB. The association between persistent fetal occiput posterior position and perinatal outcomes: an example of propensity score and covariate distance matching. *Am J Epidemiol* 2010;171:656-63.
- Senecal J, Xiong Xu, Fraser WD. Pushing early or pushing late with epidural study group. Effect of fetal position on secondstage duration and labor outcome. *Obstet Gynecol* 2005;105:763-72.
- Ponkey SE, Cohen AP, Heffner LJ, Lieberman E. Persistent fetal occiput posterior position: Obstetric outcomes. *Obstet Gynecol*. 2003;101:915-20.
- Cheng YW, Shaffer BL, Caughey AB. The association between persistent occiput posterior position and neonatal outcomes. *Obstet Gynecol* 2006;107:837-44.
- Ingemarsson E, Ingemarsson I, Solum T, Westgren M. Influence of occiput posterior position on the fetal heart rate pattern. *Obstet Gynecol* 1980;55:301-4.
- Berglund S, Grunewald C, Pettersson H, Cnattingius S. Risk factors for asphyxia associated with substandard care during labor. *Acta Obstet Gynecol Scand* 2010;89:39-48.
- Lakshmanan J, Ross MG. Mechanism(s) of in utero meconium passage. *Journal of Perinatology* 2008;28:8-13.

- Monen L, Hasaart TH, Kuppens SM. The aetiology of meconium-stained amniotic fluid: pathologic hypoxia or physiologic foetal ripening? (Review). *Early Hum Dev* 2014;90:325-8.
- Lee KA, Mi Lee S, Jin Yang H, Park CW, Mazaki-Tovi S, Hyun Yoon B et al. The frequency of meconium-stained amniotic fluid increases as a function of the duration of labor. *J Matern Fetal Neonatal Med* 2011;24:880-5.
- Berber M, Çekmez F, Purtuloğlu T. Hidden danger for the fetus: Chorioamnionitis. *J Clin Anal Med* 2014;5:432-7.
- Saunders K. Should we worry about meconium? A controlled study of neonatal outcome. *Trop Doct* 2002;32:7-10.
- Mundhra R, Agarwal M. Fetal outcome in meconium stained deliveries. *J Clin Diagn Res* 2013;7:2874-6.
- Eryilmaz OG, Sarikaya E, Akar S. Biochemical markers in meconium passage. *J Clin Anal Med* 2013;4:164-7.
- Kotarski J, Bobiński M. [Decision-to-delivery interval (DDI) for emergency cesarean sections in Polish healthcare system]. *Ginekol Pol* 2014;85:451-5.
- Rashid N, Nalliah S. Understanding the Decision-Delivery Interval in Cesarean Births. *IeJSME* 2007;1:61-8.
- Thomas J, Paranjothy S, James D. National cross sectional survey to determine whether the decision to delivery interval is critical in emergency caesarean section. *BMJ* 2004;328:665.
- Singh R, Deo S, Pradeep Y. The decision-to-delivery interval in emergency Caesarean sections and its correlation with perinatal outcome: evidence from 204 deliveries in a developing country. *Trop Doct* 2012;42:67-9.

Highest Sensitivity

Kokanalı MK, Topçu HO, Kokanalı D, Güzel AI, Elmas B, Keçecioglu M, Cavkaytar S, Doğanay M. Cesarean Section At Full Cervical Dilatation: When Is It Troubling For Newborn?. *J Clin Anal Med* 2016;7(6): 777-80.